d l14 1-10 cit,ab

1. 5,109,070, Apr. 28, 1992, Compositions of insulating polymers and sulfonated polyaniline compositions and uses thereof; Arthur J. Epstein, et al., 525/189, 420, 422, 523 [IMAGE AVAILABLE]

US PAT NO: 5,109,070 [IMAGE AVAILABLE] L14: 1 of 10
18 JUL 92 08:54:37 U.S. Patent & Trademark Office P0016

US PAT NO: 5,109,070 [IMAGE AVAILABLE] L14: 1 of 10

ABSTRACT:
Multicomponent polymeric compositions comprising self-protonated sulfonic acid-substituted polyaniline compositions or derivatives thereof and at least one insulating polymer are disclosed. The sulfonated polyaniline compositions have faster electronic and optical responses to electrochemical potentials, improved environmental stability, and improved solubility than the parent polymer, polyaniline. The multicomponent sulfonated polyaniline/insulating polymer compositions are useful in electronic, chemical, electrochemical, and optical microelectric applications which use and control the chemical and physical properties of the sulfonated polyaniline compositions.

2. 5,096,586, Mar. 17, 1992, Membranes having selective permeability; Richard B. Kaner, et al., 210/500.37; 264/41, DIG.48, DIG.62 [IMAGE AVAILABLE]
18 JUL 92 08:54:49 U.S. Patent & Trademark Office P0017

US PAT NO: 5,096,586 [IMAGE AVAILABLE] L14: 2 of 10

ABSTRACT:
Dopable, fully dense polymer membranes are used to form membranes having selective permeabilities. To improve selectivity, the membranes may be subjected to chemical or electrochemical treatment with electron donors or acceptors to alter the doping level of the polymer membrane, generally in a reversible fashion. This leads to significant changes in gas permeation rates relative to what is observed for the non-doped, fully dense polymers. This change in doping level of the polymer films can be precisely controlled by varying the concentration and nature of chemical dopants used. Desirable changes in permeation rates are achieved by a treatment which comprises a reversal doping of the polymeric material, followed by removal of the dopants (to provide an "undoped" polymer). Further addition of controlled amounts of at least one dopant species to the undoped polymer by a second, "redoping" procedure can still more dramatically change the permeability of large
18 JUL 92 08:55:03 U.S. Patent & Trademark Office P0018

US PAT NO: 5,096,586 [IMAGE AVAILABLE] L14: 2 of 10
species, leading to particularly large separation factors.

3. 5,095,076, Mar. 10, 1992, Preparation of highly soluble conductive polymer materials; Sandra K. Clement, et al., 525/435, 420, 436, 509, 524, 527, 528, 540, 928; 528/81, 157, 158, 159, 397, 422 [IMAGE AVAILABLE]

US PAT NO: 5,095,076 [IMAGE AVAILABLE] L14: 3 of 10

ABSTRACT:
Preparation of conductive polymers, particularly polyanilines having good solubility in organic solvents and high electrical conductivity, by providing a mixture of aniline, o-aniline and a flexible diamine such as 1,3-bis (3-aminophenoxy)benzene or triethylene tetramine. The mixture is reacted in the presence of an oxidant such as ammonium persulfate and a protonic

US PAT NO: 5,095,07[illegible] [IMAGE AVAILABLE] L14: 3 of 10
conductive polyaniline in which the conjugation is interrupted by an intermediate diamine group, and which renders the resulting polymer more flexible than polyaniline per se. The conductive polymer so produced also has terminal primary amino groups which aid solubility and which are further reactive. The conductive polyaniline product of the invention can be blended with non-conductive resins such as polyimides to provide cured conductive resin blends having good mechanical properties.

4. 5,093,439, Mar. 3, 1992, Processes for preparation of sulfonated polyaniline compositions and uses thereof; Arthur J. Epstein, et al., 525/540; 252/500, 518; 428/364, 402, 524, 526; 524/422, 429, 438; 525/534, 535; 528/210, 391, 422, 487 [IMAGE AVAILABLE]

US PAT NO: 5,093,439 [IMAGE AVAILABLE] L14: 4 of 10

US PAT NO: 5,093,439 [IMAGE AVAILABLE] L14: 4 of 10

ABSTRACT:
Sulfonic acid-substituted polyaniline compositions and their derivatives are produced by reacting a polyaniline polymer with SO.sub.3 gas. The sulfonated polyaniline compositions have faster electronic and optical responses to electrochemical potentials and improved environmental stability solubility than the parent polyaniline polymer.

5. 5,008,041, Apr. 16, 1991, Preparation of conductive polyaniline having controlled molecular weight; Randy E. Cameron, et al., 252/500, 518; 525/540; 528/422 [IMAGE AVAILABLE]

US PAT NO: 5,008,041 [IMAGE AVAILABLE] L14: 5 of 10

US PAT NO: 5,008,041 [IMAGE AVAILABLE] L14: 5 of 10

ABSTRACT:
Process for producing conductive polyaniline of controlled molecular weight by providing a mixture of aniline and dianiline in predetermined proportions dependent on the desired molecular weight of polyaniline to be formed. The mixture is reacted in the presence of an oxidant such as ammonium persulfate and a protonic (Bronsted) acid such as tosylic acid, to polymerize the mixture of aniline and dianiline, and forming conductive polyaniline of the desired molecular weight. Soluble conductive polyanilines having an average molecular weight not higher than about 600,000 (by gel permeation chromatography versus polystyrene in N-methyl pyrrolidone) can be obtained. Using about 6 to about 18 mols of aniline per mol of dianiline, according to one mode of procedure, conductive polyaniline having an average molecular weight ranging from about 150,000 to about 600,000 can be obtained. According to another feature of the invention, mild or weak oxidants such as

US PAT NO: 5,008,041 [IMAGE AVAILABLE] L14: 5 of 10
o-chloranil and cupric chloride, as well as strong oxidants such as ammonium persulfate, can be used in the reaction.

6. 5,006,278, Apr. 9, 1991, Solution processible forms of electrically conductive polyaniline and the method of manufacture of electroconductive articles therefrom; Ronald L. Elsenbaumer, 427/385.5; 252/500, 518, 519; 264/331.19 [IMAGE AVAILABLE]

US PAT NO: 5,006,278 [IMAGE AVAILABLE] L14: 6 of 10

ABSTRACT:

US PAT NO: 5,006,278 [IMAGE AVAILABLE] L14: 6 of 10

X. 4,983,690, Jan. 8, 1991, Conductive polymer-maleimide blends and method of producing same; Randy E. Cameron, et al., 525/436; 252/500, 511; 525/540 [IMAGE AVAILABLE]

US PAT NO: 4,983,690 [IMAGE AVAILABLE] L14: 7 of 10

ABSTRACT:
Solution blending of (a) a conductive polymer containing carbon-nitrogen linkages, such as polyaniline, having an organic group or an inorganic group, e.g., derived from an anhydride or an aromatic multisulfonic acid, covalently linked to nitrogen atoms of the polymer and (b) a malemide, particularly a bismalemide, e.g., the bismaleimide prepared by reacting 1,3 bis (3 aminophenoxybenzene) with 2 units of maleic anhydride, or a bismaleimide terminated oligomer, in a suitable solvent. On removal of solvent and heating

US PAT NO: 4,983,690 [IMAGE AVAILABLE] L14: 7 of 10
to cure the bismaleimide, a continuous phase blend of the conductive polymer and the bismaleimide is formed, having good electrical conductivity and strength. The solution blend can be applied as a coating on a substrate or can be processed to a powder which can be compressed into parts. The conductive blend can be melted and cured without the evolution of volatiles.

X. 4,983,322, Jan. 8, 1991, Solution processible forms of electrically conductive polyaniline; Ronald L. Elsenbaumer, 252/500, 518, 519 [IMAGE AVAILABLE]

US PAT NO: 4,983,322 [IMAGE AVAILABLE] L14: 8 of 10

ABSTRACT:
This invention relates to solutions and plasticized compositions of electrically conductive substituted and unsubstituted polyanilines and to

US PAT NO: 4,983,322 [IMAGE AVAILABLE] L14: 8 of 10
methods of forming such solutions or compositions and use of same to form conductive articles.

X. [redacted], Aug. 8, 1989, Conductive polymer-polyimide blends and method for producing same; Stuart I. Yaniger, et al., 525/436; 252/500; 525/540

US PAT NO: [redacted] L14: 9 of 10

ABSTRACT:
A conductive polymer blend which comprises mixing a polyimide with a base-type polymer containing carbon-nitrogen linkages, such as polyaniline, having a polyimide-like group covalently linked to nitrogen atoms of the base-type polymer. The conductive polymer blend is formed by first reacting a base-type non-conductive polymer containing carbon-nitrogen linkages, such as

US PAT NO: [redacted] L14: 9 of 10
polyaniline, with a carbonyl anhydride, such as 3,3',4,4'-benzophenone tetracarboxylic dianhydride, to form a conductive polymer containing polyimide-like groups covalently linked to nitrogen atoms of the base-type polymer, mixing such conductive polymer with non-conductive polyimide in a suitable solvent, removing the solvent, and forming a conductive continuous

phase blend of the polyimide and the conductive polymer.

10. 4,851,487, Jul. 25 1989, Conductive polymer materials and method of producing same; Stuart L. Yaniger, et al., 525/540; 252/500, 511; 528/332, 391, 422

US PAT NO: 4,851,487 L14: 10 of 10

ABSTRACT:
Production of base-type conductive polymers, particularly from the family of

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conductive polyaniline, by reacting a base-type non-conductive polymer containing carbon-nitrogen linkages, e.g., polyaniline, with an anhydride, such as R--SO.sub.2 --O--SO.sub.2 --R', R--CO--O--CO--R', or R--CO--O--SO.sub.2 R', or mixtures thereof, where R and R' are alkyl or aryl, e.g., tosylic anhydride or benzophenone tetracarboxylic dianhydride, and forming an electrically conductive polymer in which the SO.sub.2 R and COR groups are covalently linked to the nitrogen atoms of the conductive polymer and the anion of the conductive polymer is the SO.sub.3 R' or O.sub.2 CR' group.

=> s (polyacrylic or polysulfonic or polyamic or polyphosphoric)(2p)(dopant# or dope# or agent# or doping)
11539 POLYACRYLIC
265 POLYSULFONIC

963 POLYAMIC
5064 POLYPHOSPHORIC
11178 DOPANT#
28336 DOPE#
274845 AGENT#
14868 DOPING
L16 8137 (POLYACRYLIC OR POLYSULFONIC OR POLYAMIC OR POLYPHOSPHORIC)(2P)(DOPANT# OR DOPE# OR AGENT# OR DOPING)

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1. 5,079,121, Jan. 7, 1992, Seamless polymeric belts for electrophotography and processes for the preparation thereof; John S. Facci, et al., 430/62; 252/500; 427/12; 428/515; 430/69 [IMAGE AVAILABLE]

2. 4,992,349, Feb. 12, 1991, Cyclic bis-dicarboximide charge transport compounds for electrophotography; Chin H. Chen, et al., 430/58; 252/500 [IMAGE AVAILABLE]

3. 4,989,607, Feb. 5, 1991, Highly conductive non-stringy adhesive hydrophilic gels and medical electrode assemblies manufactured therefrom; Preston Keusch, et al., 128/640, 798, 802; 252/500 [IMAGE AVAILABLE]

4. 4,988,597, Jan. 29, 1991, Conductive and blocking layers for electrophotographic imaging members; John W. Spiewak, et al., 430/62; 252/500; 430/64 [IMAGE AVAILABLE]

5. 4,771,111, Sep. 13, 1988, Polypyrrole/polyimide compositions; Bernd Tieke, et al., 525/182; 252/500; 428/473.5; 525/180, 417, 436

6. 4,731,311, Mar. 15, 1988, Electrically conductive material and secondary battery using the electrically conductive material; Tetsumi Suzuki, et al.,

429/213; 252/500

7. 4,698,391, Oct. 6, 1987, Crosslinked polymers with lowered resistivity and materials and methods for their preparation; Paul D. Yacobucci, et al., 525/162; 252/500, 511; 525/190, 428, 443, 510, 523

8. 4,654,273, Mar. 31, 1987, Electromagnetic shielded body; Arthur E. Gurgiolo, et al., 428/522; 252/500; 428/520; 525/381

9. 4,620,943, Nov. 4, 1986, Bicarbazole-oxadiazole electroactive polymers; Peter Denisevich, Jr., et al., 252/518, 500; 524/80, 167, 300, 404, 408, 410, 415, 419, 421, 429, 443; 528/363

10. 4,597,896, Jul. 1, 1986, Carbazole-oxadiazole electroactive polymers; Peter Denisevich, Jr., et al., 252/500, 518; 524/80, 401; 528/341

11. 4,588,762, May 13, 1986, Pressure sensitive adhesive compositions for

medical electrodes; Norbert J. Mruk, et al., 524/45; 156/327, 328; 252/500, 510, 511; 424/449; 428/355, 356; 524/272, 434

12. 4,539,996, Sep. 10, 1985, Conductive adhesive and biomedical electrode; Michael R. Engel, 128/640, 798; 252/500

13. 4,519,940, May 28, 1985, Triazole electroactive polymers; Albert H. Schroeder, et al., 252/500, 512, 518; 528/183, 341, 363

14. 4,519,938, May 28, 1985, Electroactive polymers; Yoram S. Papir, 252/500, 510, 514, 516

15. 4,505,844, Mar. 19, 1985, P-Type polyphenoxazine electroactive polymers; Peter Denisevich, Jr., 252/500, 512, 518; 528/183, 210, 342, 363, 374

16. 4,505,843, Mar. 19, 1985, Heterodiazole electroactive polymers; Shigeto Suzuki, et al., 252/500, 512, 518; 528/183, 341, 38[illegible]

17. 4,505,840, Mar. 19, 1985, Heterocyclic electroactive polymers; Victor P. Kurkov, 252/500, 512, 518; 528/183, 341, 363

18. 4,502,980, Mar. 5, 1985, Dithiene electroactive polymers; Peter Denisevich, Jr., et al., 252/500, 512, 518

19. 4,010,117, Mar. 1, 1977, Electroconductive material; Motokazu Maruhashi, et al., 252/500; 430/62

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L1   (      4462)SEA FILE=USPAT CONDUCT?(3A)POLYMER#
L2   (       460)SEA FILE=USPAT CONDUCT?(P)(POLYANILINE# OR POLYTHIOPHENE# OR
L3   (      4539)SEA FILE=USPAT L1 OR L2
L4   (       142)SEA FILE=USPAT (POLYANILINE# OR POLYTHIOPHENE# OR POLYPYRROLE
L5   (      4548)SEA FILE=USPAT L4 OR L3
L6   (     12717)SEA FILE=USPAT (POLYACRYLIC OR POLYSULFONIC OR (CELLULOSE(W)S
L7   (     17460)SEA FILE=USPAT L6 OR POLYPHOSPHORIC
L8   (        98)SEA FILE=USPAT L7(P)(DOPANT# OR DOPING OR DOPE# OR POLYDOPANT
L9   (        15)SEA FILE=USPAT L8 AND L5
L10  (      1574)SEA FILE=USPAT 252/500,511/CCLS
L11           0 S 252/500
L12         773 S 252/500/CCLS
L13          51 S L12 AND L7 NOT L9
L14          10 S (4855361 OR 4851487)/PN,UREF,BI
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L15          49 S L13 NOT L14
L16        8137 S (POLYACRYLIC OR POLYSULFONIC OR POLYAMIC OR POLYPHOSPHORIC)
L17          19 S L16 AND L15
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